

FUCOXANTHIN SOLVENT SOP



In Association with SVCH-Technologii, Moscow (Russia)
ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018

ABOUT US

KERONE is now renowned for serving the specialized needs of customers with the best quality and economical process of Heating /cooling and drying products, manufactured in a high-quality environment by a trained and qualified workforce (special purpose machinery)

-  48+ Years Manufacturing Excellence
-  Great Sale Support
-  Highly Customized Product
-  Adherence to Standards
-  Sound Infrastructure
-  Team of experts Delivering Quality
-  Timely Delivery
-  Cost Effective Solutions



KERONE is a pioneer in application and implementation engineering with its vast experience and team of professionals.



KERONE is devoteded to serve the industry to optimize its operations both economically and environmentally with its specialized heating and drying solutions.



KERONE is having immense expertise in manufacturing and implementing various types of engineering solutions.



KERONE is possessing employee strength of more than 280+ experts continuously putting efforts for happy industrial engineering solutions.

WHY CHOOSE US

With decades of expertise, cutting-edge technology, and a customer-centric approach, Kerone Engineering offers tailor-made heating solutions that prioritize quality, flexibility, and cost-effectiveness. Benefit from our commitment to excellence, post-sales support, and innovative solutions for your unique heating needs. Choose Kerone Engineering for reliability, performance, and unmatched value.

MISSION

- ✓ To enhance the value of customer operation through our customer need centric engineering solution
- ✓ We are committed to provide our customers, unique and best in class products in Industrial heating drying and cooling segment with strategic tie-up for the technical know-how with renowned leader in the industry specific segment

VISION

- ✓ Turn into a world leader in providing specialized, top-notch quality and ecological industrial heating, cooling, and drying solutions across the globe.
- ✓ To attain global recognition as the best of quality and environment-friendly engineering solution company.

“

Enhance the value of customer operation through our customer need centric engineering solution.

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FUCOXANTHIN PURIFICATION SOP FROM PHAEODACTYLUM TRICORNUTUM

1. Biomass Preparation

- | Use freeze-dried or vacuum-dried *P. tricornutum* biomass.
- | Grind to fine powder for increased extraction efficiency.

2. Crude Extraction

- | Solvent: Ethanol (80-90%) or methanol.
- | Mix 1 g dried powder with 20 mL solvent, shake for 2-4 hours.
- | Filter and repeat 2-3 times. Combine and evaporate under vacuum at $\leq 40^{\circ}\text{C}$.

3. Liquid-Liquid Partitioning

- | Use n-Hexane:Water:Methanol system or Hexane:Acetone.
- | Remove lipids (hexane), polar impurities (brine). Retain mid-polar pigment layer.

4. Column Chromatography

- | Use Silica Gel 60 or C18 reverse phase.
- | Elute with gradient: Hexane:Acetone or Methanol:Water.
- | Monitor fractions via UV-Vis (446 nm) or TLC. Pool orange-rich fractions.

5. Final Purification (Optional: HPLC)

- | Use preparative HPLC with C18 column.
- | Solvent: Acetonitrile:Water or Methanol:Water.
- | Collect peak matching RT and absorbance at 446 nm.

6. Drying and Storage

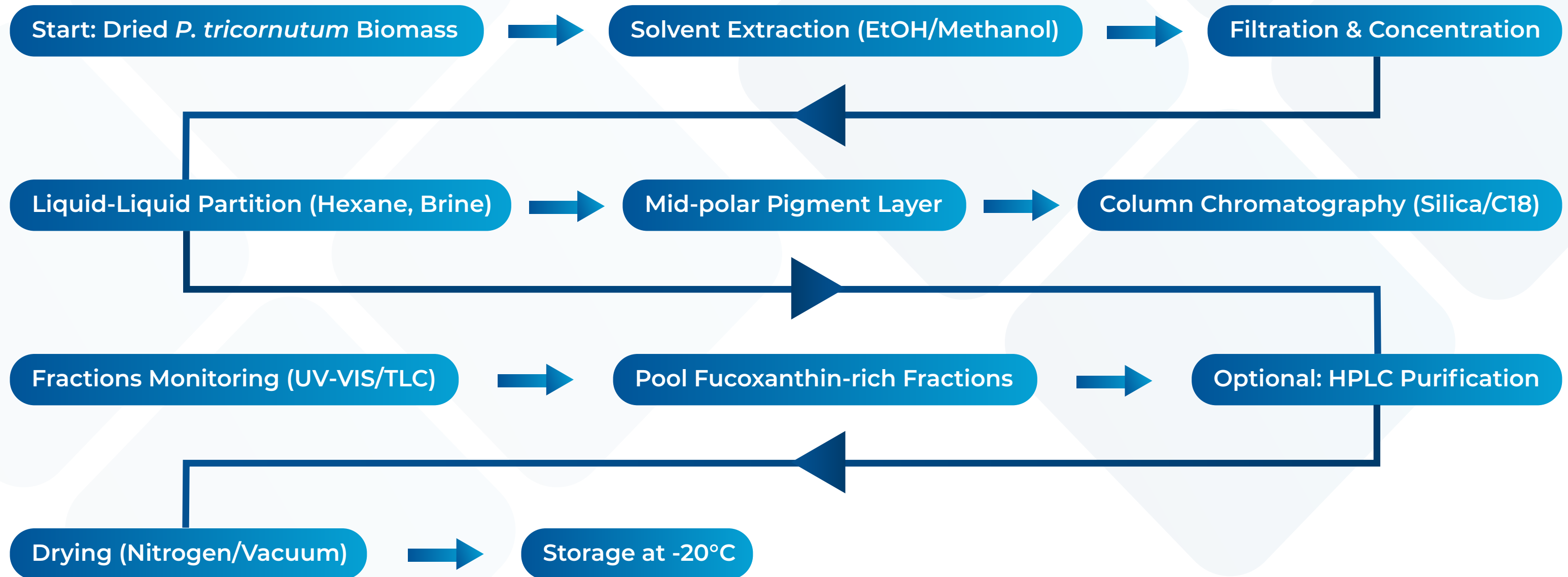
- | Dry under nitrogen or vacuum.
- | Store in amber vials at -20°C under inert atmosphere.

7. Equipment & Materials List

- | Freeze-dryer or vacuum oven
- | Rotary evaporator
- | Separatory funnel
- | Silica gel or C18 resin
- | UV-Vis spectrophotometer or TLC plates
- | HPLC system with C18 column (optional)
- | Solvents: Ethanol, Methanol, n-Hexane, Acetone, Acetonitrile, Brine



FUCOXANTHIN PURIFICATION PROCESS FLOWCHART



WHY SSMVD-DRIED BIOMASS YIELDS SUPERIOR FUCOXANTHIN

- | **Drying Method:** Solid-State Microwave Vacuum Dryer (SSMVD)
- | **Temperature Maintained:** Below 32°C under vacuum

Key Advantages:

- | **Preserves Fucoxanthin Integrity:** Avoids thermal degradation and pigment breakdown.
- | **Uniform Microwave Energy:** Solid-state technology ensures consistent heating without hotspots.
- | **Low Oxygen Environment:** Vacuum drying minimizes oxidation and photodegradation.
- | **Rapid Drying:** Fast moisture removal reduces residence time, preserving bioactive compounds.
- | **High Bioavailability:** Retains native pigment structure and purity.

Application Impact:

This drying method significantly enhances the quality of fucoxanthin extracted from *Phaeodactylum tricornutum*, making it ideal for high-value nutraceuticals, cosmetics, and clinical-grade formulations.

Certification Statement:

The biomass used for fucoxanthin extraction was dried using SSMVD technology at temperatures below 32°C in a low-oxygen environment to preserve thermolabile compounds.

COMPARISON OF SOLVENT EXTRACTION AND SUPERCRITICAL CO₂ EXTRACTION FOR FUCOXANTHIN

Parameter	Solvent Extraction	Supercritical CO ₂ Extraction
Solvent Type	Ethanol, Methanol, Acetone	CO ₂ + Ethanol (co-solvent)
Temperature	Room Temp to 50°C	40–60°C
Pressure	Atmospheric	200–400 bar
Selectivity	Moderate	High (tunable)
Purity Range	50–85%	70–95%
Environmental Impact	Medium (solvent waste)	Low (green solvent)
Residual Solvent	Yes	No
Scalability	Easy	Medium (requires equipment)
Yield Potential	5–10 mg/g	5–10 mg/g

TRUSTED PARTNERS

AFCONS

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ISO 14001:2004



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WE CREATE SOLUTIONS



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TATA CONSULTING ENGINEERS LIMITED

SC Shroff Consultants

STERLING & WILSON

THANK YOU

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